

## WHAT IS CLAIMED IS:

1. A bar code scanning system, comprising:

a plurality of laser light sources;

580 a plurality of optical input channels, each having,

(a) a photodetector;

(b) a signal processing circuit;

(c) a digitizer circuit; and

(d) a FIFO buffer; and

585 a single microprocessor for receiving the output from each optical channel and decoding the output to produce bar code symbol character data.

2. A scanner comprising:

590 (a) a plurality of input channels, each said channel including a photodetector, each such channel providing an data elements representing light impinging on the photodetector of such channel;

595 (b) means for exposing the photodetectors of said channels to light from objects to be scanned so that the light impinging on the photodetector of each channel represents an optical property of objects to be scanned at a series of points along a scanning path associated with such channel;

600 (c) data stream means for accepting data elements from each channel and outputting a stream of data elements including data elements from said plurality of channels; and

(d) a decoder operative to examine said stream of data elements and recover information denoted by the data elements in said stream.

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3. A scanner as claimed in claim 2 wherein said data stream means is operative to store data elements from each channel, retrieve the stored data elements and form said stream from the retrieved data elements.

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4. A scanner as claimed in claim 3 wherein said data stream means is operative to provide said stream of data elements so that said stream includes a plurality of series of data elements, the data elements within each such series being data elements from a single one of said channels.

5. A scanner as claimed in claim 4 wherein said data stream means is operative to provide said stream of data elements so that series of data elements from different channels are provided in alternating sequence, with a series of data elements from one channel followed by another series of data elements from a different channel.

6. A scanner as claimed in claim 4 wherein each said channel includes a signal processing and digitization circuit connected to the photodetector, the signal processing and digitization circuit of each channel supplying said data elements in digital form.

630 7. A scanner as claimed in claim 6 wherein the signal processing and digitization circuit of each said channel is arranged to supply said data elements as transition data elements, each such transition data element including data denoting a transition as mark-to-space or space-to-mark and data denoting the duration of an interval between successive transitions.

8. A scanner as claimed in claim 7 wherein the signal processing and digitization circuit of each channel includes (i) a signal processing circuit having an analog input connected to the photodetector and having an output and (ii) a digitizer having an input connected to the output of the signal processing circuit.

9. A scanner as claimed in claim 5 wherein said data stream means includes a FIFO buffer associated with each said channel and having an input connected to the processing and digitization circuit of such channel and an output, said data stream means further including a multiplexer having inputs connected to the outputs of the FIFO buffers associated with all of said channels and an output connected to said processor.

650 10. A scanner as claimed in claim 5 wherein at least one of said channels is a partially-active channel having active and inactive intervals, said exposing means being arranged so that data elements from each such partially-active channel for at least a part of each said inactive interval do not represent meaningful data, and wherein said data stream means is operative to provide the data elements for each said active interval of each said partially-active channel in a single series of data elements within said stream.

660 11. A method of scanning objects bearing codes comprising:  
(a) exposing a plurality of photodetectors, each associated with a separate input channel, to light from objects to be scanned so that the light impinging on each photodetector represents an optical property of objects to be scanned at a series of points along a scanning path associated with such photodetector ;  
670 (b) operating each such input channel to provides data elements representing light impinging on the photodetector of such channel;  
(c) forming a stream of said data elements including data elements from a plurality of said channels; and  
(d) examining said stream of data elements in a decoder and recovering information denoted by the data elements in said stream of data elements.

12. A method as claimed in claim 11 further comprising storing data elements from each channel, the step of forming a stream of data elements being performed by recovering said stored data 680 elements from each channel and providing a plurality of series a plurality of series of data elements, the data elements within each such series being data elements from a single one of said channels.

685 13. A method as claimed in claim 12 wherein said series of data elements from different channels are provided in alternating sequence in said stream of data elements, with a series of data elements from one channel followed by another series of data elements from a different channel.

690 14. A method as claimed in claim 12 further comprising processing and digitizing the signals from each said photodetector within the channel associated with such photodetector, so that the data elements from each channel are in 695 digital form.

15. A method as claimed in claim 12 wherein said data elements from each channel are transition data elements, each such transition data element including data denoting a transition as 700 mark-to-space or space-to-mark and data denoting the duration of an interval between successive transitions for such channel.

16. A method as claimed in claim 12 wherein said data elements from each channel are mark and space values each representing 705 light impinging on the photodetector of such channel at a given time.

17. A method as claimed in claim 12 or claim 13 wherein each said channel is associated with a separate FIFO buffer, and 710 wherein said step of storing data elements includes inputting the

data elements from each said channel to the FIFO buffer associated with such channel in temporal order, and wherein said step of forming said data stream includes outputting samples from one of said FIFO buffers at a time.

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18. A method as claimed in claim 11 or claim 12 or claim 13 wherein said step of forming said stream of data elements is conducted so that data elements from all of said channels are included in said stream, and wherein only a single decoder is 720 used to examine said stream.

19. A method as claimed in claim 13 wherein at least one of said channels is a partially-active channel having active intervals and inactive intervals, said exposing step being conducted so 725 that data elements from each such partially-active channel for at least a part of each said inactive interval do not represent meaningful data, and wherein said step of forming said stream of data elements is conducted so that the data elements for each said active interval of each said partially-active channel is 730 provided in a single series of data elements within said stream.